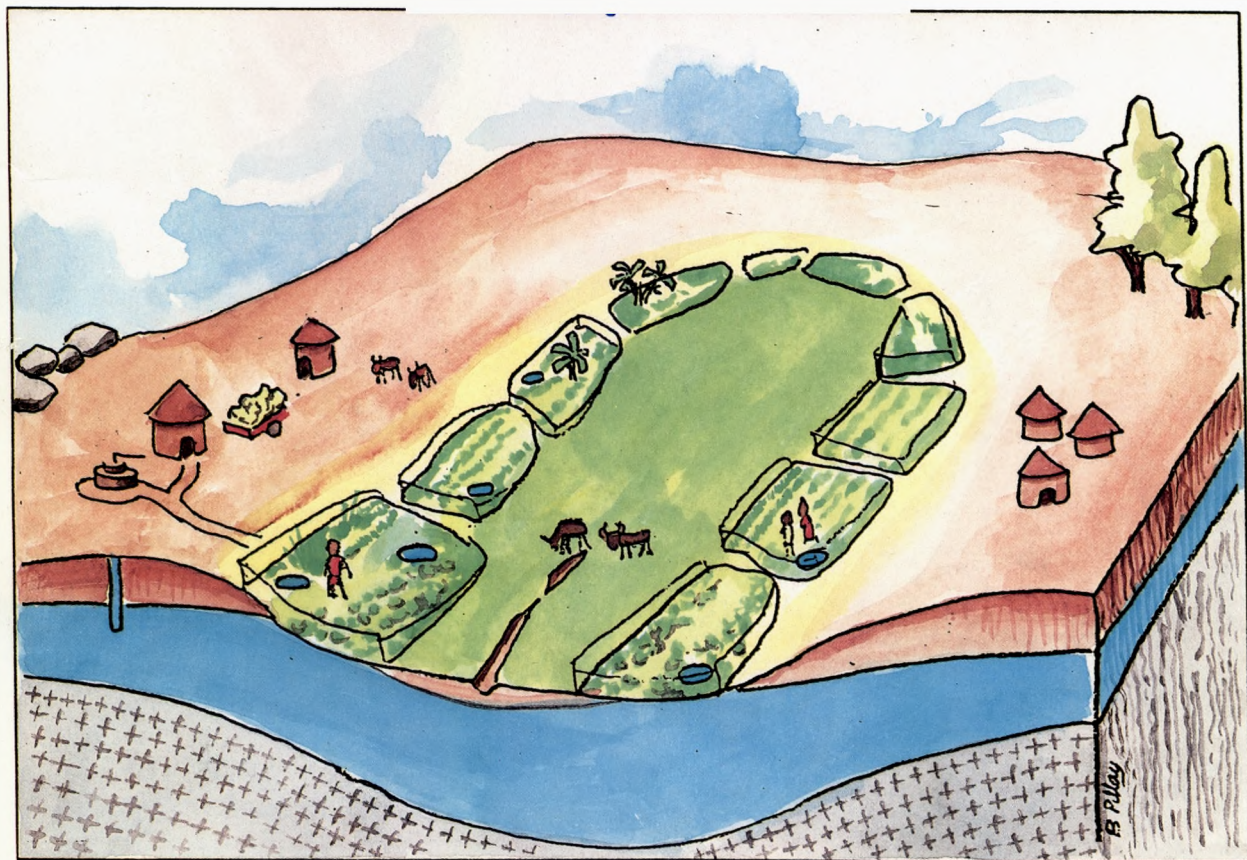


DAMBO FARMING IN ZIMBABWE:



Water Management, Cropping and Soil Potentials for Smallholder Farming in the Wetlands

Editors: Richard Owen, Katherine Verbeek, John Jackson and Tammo Steenhuis

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Conference Proceedings

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Wetlands and Water Harvesting as Resources in Communal Farmers' Food Security: A Case from Zvishavane

Z. Phiri Maseko¹ and M. Bussink²

Introduction

Although a large part of the Zimbabwean population is living in and dependent on semi-arid and sandy-soil areas, the cultivation of the wetlands is still severely restricted by law. As during colonial times, environmental arguments are used to prevent communal farmers from using the wetlands.

The question is not whether or not the wetlands should be used, but how they should be used. In this paper we hope to show that a sustainable and deliberate use of the wetlands by communal farmers is desirable and possible. Access to wetlands can give farmers an opportunity to stabilize their production and by doing so improve their food security. A change in the legislation is needed for this to be possible.

Hopefully, the importance of the (potential) use of the wetlands and water harvesting will be more widely recognized by policy makers and others involved in rural development in the communal areas.

To contribute to the debate about wetlands we present a case study of Mr. Phiri Maseko's farm and the Zvishavane Water Resources Project (ZWRP). Community-based water projects are the main focus of the ZWRP.

Phiri Maseko Farm

Zvishavane belongs to Natural Region IV, receiving around 570 mm of rainfall annually. The District includes Runde Communal Area where Mr. Phiri Maseko's farm is situated. After incorporating a dambo and water projects into his own farm, he started assisting the

¹Phiri Maseko is a communal farmer in Runde Communal Area, Zvishavane District. He has extensive experience with the use of wetlands and small-scale water-harvesting methods. He is the founder and director of the Zvishavane Water Resources Project, a local non-governmental organization which is involved in community-based projects such as dam construction, water tanks, community gardens, and erosion control measures. Address: ZWRP, Box 118, Zvishavane, Zimbabwe

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communities in the surrounding areas with their projects. Initially working within the Lutheran World Federation, Mr. Phiri later founded a new organization, the Zvishavane Water Resources Project (ZWRP), in 1987. Besides being director of ZWRP he continues to develop his own farm, with the help of his family.

During the early 1960s Mr. Phiri lost his job at the railways due to his trade union activities. In order to support his family, he concentrated on working on his plot of land and became a dedicated farmer. He gained an understanding of how to manage his land without damaging it. He achieved this by studying intensively the local environment and by practicing agriculture using the locally-available resources. The dambo (Guvi in Shona) is an example of this.

This brought him into conflict with the authorities, as the use of wetlands has been forbidden since early colonial times. During those times African farmers were able to outcompete the new settler farmers, especially on the rice markets, due to the use of the dambos. Restrictive legislation was introduced and later enforced by the settler state. These laws were enacted in the name of environmental protection but in fact protected the economic position of the white farmers.

Mr. Phiri had to appear before court three times for using the dambo. Twice he was condemned, but the third time he asked the magistrate to come to his plot to determine what was wrong with what he was doing. Visiting the farm, the magistrate had to admit that nothing was wrong with it and Mr. Phiri was subsequently released. It appeared that not only was nothing wrong with his way of farming, but that his methods made high productivity possible without damaging the main resource base, the land.

Mr. Phiri's land consists of a 3 ha plot on which he manages hydrology, employs water and soil conservation techniques, and makes optimal use of diverse soil and crop types.

The management of the hydrology starts on the land upslope from his fields where his yard is. His yard is situated at the bottom of a

'ruware' (an eroded rock). At the upper border of his yard he has constructed two terraces to catch part of the waterflow from the ruware. By containing the waterflow in the terraces, the water has the opportunity to penetrate the soil, making it available for the fields instead of simply running-off. At the upper part of the ruware, sand traps are constructed to prevent the terraces from silting up.

Within the yard there is a water tank which collects water from a corrugated iron roof. A small garden within the yard is irrigated with the water collected in this tank. In this garden different types of vegetables are grown; experiments with new types of food crops and grasses are done; and there is a nursery for fruit trees. Even during dry rainy seasons Mr. Phiri was able to grow at least some vegetables with the water caught from the roof.

The dambo starts downslope from his yard. In its upper part a pond is constructed which is filled during heavy rainfalls. The water is prevented from being lost and can be used for different purposes, even during the dry season, when the rainfall during the rainy season has been average. Together with the water from four different types of wells in the dambo area, the water from the pond can be used for irrigation during dry spells in the rainy season as well as after the rainy season ends. The water can be distributed to drier parts of the plot via several canals.

Another element in managing the plot's hydrology is the presence of contour pits and ridges in the field. Soil is conserved in the ridges, and in rare cases they are useful in diverting excessive water flow.

The introduction of pits along the ridges is intended mainly for water conservation with the side benefit that they also contribute to soil conservation. Along the ridges of some drier fields in the plot, Mr. Phiri dug rectangular pits. After a rain, part of the water flow is stored in the pits instead of being lost. The water in the pits seeps into the soil and this moisture is then available to the crops.

Constant water availability is one advantage of farming the wetlands. Another one is that the soils of the wetlands are often rich in clay.

The interior part of the dambo area has heavier grey soils. In good seasons two harvests are possible there, without requiring much nutrient input. Maize is the main crop planted in this area. In the more dry and sandy fields, crops like nzungu (groundnuts), roundnuts, munga (bullrush millet), rapoko (finger millet) mapfunde (sorghum), pumpkins and beans (which are both intercropped with maize) are grown. Manure is mainly applied in these fields.

In Mr. Phiri's yard, on the fields, and in the dambo area a great variety of crops, plants and trees are grown (both exotic and indigenous). Mangoes, guavas, oranges (grafted on lemon trees), pawpaw, mfura and muchakata are also abundant on his plot. Bananas are grown in the wettest part of the dambo, adjoining the pond. Bananas are suitable for dambo areas, not only because of the availability of moisture and nutrients, but also because they hold the soil and prevent soil erosion. In good years, bees are kept among the bananas and fish are raised in the pond. Between the bananas and the pond, reeds suitable for basketmaking are grown. Fodder grass is grown for cattle grazing during the dry season. The banana leaves are also suitable as cattle fodder. In wetter years, rice can be cultivated and inter-cropped with vegetables in the central part of the dambo.

During the cropping season of 1988-1989, 23 different crop species and 26 different tree species plus reeds and grass fodder were growing on his plot (Scoones, 1991). Some of the other crops found on the farm are: *leucena*, *sesbania* (both are nitrogen-fixing trees/shrubs and, among other things, suitable for goat fodder), and grenadines. The growing of cassava plays an important role in coping with droughts; it can be left unharvested in good years, and is a valuable nutritious food-crop in dry years.

The principles of variation and heterogeneity are applicable to Mr. Phiri's overall strategy. Aspects of these mutually interrelated principles are: making use of the heterogeneity of the environment (using the resources which are there); minimizing risks, therefore improving food security; and conserving soil and water.

Making use of the heterogeneity using not only the drier fields but also the wetland, results in improved water and nutrient availability during dry spells in the rainy season, during the dry season, and during drier years. This is one aspect of minimizing risks. The other (which is related to the former) is the great variety of crops and trees. Although the effects of this drought on Mr Phiri's farm are dramatically visible, plenty of mangoes and guavas have been harvested. They provided food for the family as well as income when they are sold.

Variety in crops can mean that during one season some crops might do badly, while others do well. So growing more than just one or a limited number of crops makes the farm less vulnerable. This principle is applicable on the farm as a whole but is also applied in individual fields. Intercropping, the practice of growing different crops in one field, is successfully employed on Mr. Phiri's farm.

A third aspect of variety and heterogeneity is soil and water conservation. The large variety of trees in all parts of the plot, including the fields, has a soil-conserving influence. Some of the trees have a positive impact on the crops. The negative impact other trees might have on crops is mitigated by the fruits the trees bear and by their soil conserving influence. The diversity in trees and crops results in an optimal ground cover which helps conserve water as well as soil.

To summarize, the deliberate use of wetlands makes it possible to intensify production, to extend the periods of production, and to diversify production. This minimizes risks, and improves communal farmers' food security and economic position. Soil and water conservation are the means through which such improvements in production are made, as well as ends in themselves.

The Zvishavane Water Resources Project

Tapping local resources is an essential base for improving communal farmers' food security. Local NGOs can play an important role in assisting rural communities in identifying these resources. The Zvishavane Water Resources Project (ZWRP) is such an NGO. The ZWRP originated from a research team of which Mr. Phiri was one of the members. This team organized meetings with local farmers where potential land-use innovations were discussed.

This "farmer-based research should not be used simply for more effective extraction of knowledge which then forms the basis for typical 'top-down' development. Research should be seen as an opportunity for devolving power and establishing local capability for development." (Maseko *et al.*, 1988)

In the creation of ZWRP, ways were found to establish this local capability. Mr. Phiri travelled to the United Kingdom where he found donors willing to support the ZWRP.

Community workers of the ZWRP, together with community members, identify potential projects. After deciding on a project, the project is implemented. The ZWRP delivers the materials, and a project assistant of ZWRP helps the community to construct the project. Past projects include the construction of: wells; small cement and earth dams; roof tanks, especially at schools; ruware tanks, to catch water from ruware-rocks; community gardens, on or near dambos or irrigated with the water from the constructed dams; and erosion control measures, e.g. sand traps to prevent siltation of the dams.

The success of a project depends on a community's willingness to identify its own needs and problems and then become actively involved in the project.

Not every project follows this ideal plan. For example, sometimes projects become 'food-for-work' projects. This can mean that people lose their initial motivation for a project, or that from the beginning their main interest is the delivery of food. After the food programme

The promotion of chemical fertilizers, mono-cropping, and removal of trees are part of the Agritex policy and don't fit into a strategy adapted to the local environment and directed to diversity

is over, the people might lose interest in working for the project. So a careful relationship between projects and their aims is necessary.

Of course ZWRP is working within a local institutional infrastructure consisting of WARDCOs, VIDCOs, local leaders, District Councils, Agritex officials and extension workers and other NGOs. Relations between these institutions are largely cooperative. But sometimes differences in rural development philosophies of the various institutions (and the power relationship between them) can lead to hidden conflicts, such as the conflict over the use of the wetlands.

Another example concerns the construction of wells. Initially, the ZWRP was involved in the successful construction of more than 80 shallow wells. But when the District received an offer from a foreign donor to construct deep wells on a large scale, the ZWRP was not allowed to finish the wells which were already under construction. One argument used by the authorities to stop the construction of the shallow wells was that they were not hygienic, an allegation that has been challenged by ZWRP and others.

Furthermore, the widespread construction of deep wells can lead to desertification of the area. Vegetation surrounding the deep wells may suffer due to a lowering of the water-table. The deep-well project is an example of projects which are not locally adapted and might therefore have disastrous effects.

While there is cooperation, differences of opinion also exist between Agritex and ZWRP. The promotion of chemical fertilizers, monocropping, and removal of trees from the fields are part of the Agritex policy. These practises do not fit into a strategy which is adapted to the local environment and directed toward diversity.

One of ZWRP's wishes for the future is to have its own agricultural extension worker. This, however, does not mean that the cooperation with Agritex will come to an end.

Legalisation of Dambo Cultivation

Laws continue to restrict the use of wetlands. It is possible to get permission for using the dambo, but it is a long and difficult process with the Natural Resources Board and Agritex officials having the final decision about applications.

Farmers in the communal areas often reject this piece of legislation. They see it as an unfair imposition. In the words of a farmer in Runde commenting on stream-bank cultivation which is also restricted under the law:

"Once we had one [a vegetable garden] near a river bank, but it was taken by the government 4 years ago. We used to grow tomatoes, rape, cabbage, cauliflower, and choumoelier. We consumed much, but used to sell as well.

The 'Mr. M. Company' [Mr. M. is the Agritex extension worker in the area] took the garden from me. I didn't resist; they [Mr. M. and other officials] were given commands by the government which has much power. I am very angry at the government. At this moment we are starving, are in need of money and not allowed to use the garden. I don't think soil erosion was the reason from the government, but that they want us to create cooperatives. We are only allowed to use the streambank if we create cooperatives. At this moment the streambank isn't used at all, not even by a cooperative. It's bad to make a cooperative. Because if you want to grow different crops, you can't

do it because you have to follow the cooperative regulations."³

The Wetland and Streambank legislation is an inheritance of the colonial era. It is possible to conclude that the State continues, as it did during colonial times, to use environmental arguments to impose its own agricultural development concept upon the farmers.

An Africanization of the legislation is needed. The use of the wetlands should become legal. However, legalization alone is not sufficient. It should be accompanied by criteria which will ensure the sustainable use of the wetlands. These criteria should be accompanied by an extension and information programme. They should make use of the knowledge the farmers already have about using the wetlands which comes from an historical awareness about the use of the wetlands in their area.

An extension programme should consist of the following central elements:

1. Soil conservation: ploughing and planting across the slopes, not along them.
2. Water conservation: the wetland is seen as an integral part of a plot of land and the management of the hydrology of the plot. A deliberate management of the hydrology can only be based on extensive experience with and insight into water movement on a particular plot.
3. Crops suitable to the wetland: crops or grasses should be planted which hold the soil, e.g., bananas, reeds, kikuyu-grass, rice. Maize is not a very suitable crop, especially not year after year.

**The question is not
"whether or not" the
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but "how" they should
be used**

³Interview by Michiel Bussink, Runde CA, January 1992

Conclusion

The use of dambos and streambanks can mean an improvement in the food security and self reliance of communal farmers. However, legal restrictions should be lifted to make it easier for communal farmers to use

wetlands. Rural development should be adapted to accomodate widely varying local circumstances. As Mr. Phiri's farm and the success of the ZWRP demonstrate, community-based projects can play an important role in achieving these goals and in creating sustainable rural development.

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